WHAT IS CLAIMED IS:

1. Data processing apparatus for evaluating answers to respective query items considered to be represented by respective points within a region of feature space, which region is subdivided into subregions according to at least first and second subdivisions, said apparatus comprising:

an input which receives such a query item;

a subregion identifying portion operable, for each said subdivision of said region, to identify which said subregion of the subdivision contains the point representing the received query item;

a partial answer retrieval portion having access when the apparatus is in use to a store of precalculated partial answers for at least some said subregions of said subdivisions, and operable to retrieve from the store the partial answers for the or each identified subregion that is present in the store;

an answer calculation portion which calculates an answer to said received query item based on the retrieved partial answers; and

an output which outputs the calculated answer.

2. Data processing apparatus according to claim 1, wherein said answer calculation portion calculates an answer to said received query item by summing said retrieved partial answers.

3. Data processing apparatus according to claim 1, wherein one of said subdivisions contains a single subregion.

4. Data processing apparatus according to claim 3, wherein said single subregion covers the whole of said region of feature space under consideration.

5. Data processing apparatus according to claim 1, wherein each said subdivision represents a particular level of resolution and the region of feature space is subdivided into subregions of a particular size according to the level of resolution for the subdivision concerned.

6. Data processing apparatus according to claim 5, wherein the second subdivision has a higher level of resolution than the first subdivision, and so on for further subdivisions, if any.

7. Data processing apparatus according to claim 5, wherein the region of feature space is subdivided into 2^{LD} subregions, where L is the level of resolution and D is the dimension of feature space.

8. Data processing apparatus according to claim 1, wherein the subregions of any one subdivision are non-overlapping with another subregion of that subdivision.

9. Data processing apparatus according to claim 1, wherein said partial answer retrieval portion is operable to retrieve from said store further partial answers for one or more subregions surrounding the or each subregion identified by said subregion identifying portion, and said answer calculation portion calculates

an answer to said received query item based on the retrieved partial answers for all such subregions.

10. Data processing apparatus according to claim 9, wherein said answer calculation portion calculates an answer to said received query item by forming a weighted sum of said retrieved partial answers, the weight for a particular partial answer being set in dependence upon the distance of the surrounding subregion associated with that partial answer from the subregion identified by said subregion identifying portion.

11. Data processing apparatus according to claim 1, wherein said answer is considered to be represented by a point within a region output space of one or more dimensions.

12. Data processing apparatus according to claim 1, wherein a query item comprises a set of measurement values and said answer represents a class assignment or decision based on those measurement values.

13. Data processing apparatus according to claim 1, wherein the apparatus is a learning machine which approximates an arbitrary decision function.

14. Data training apparatus for analysing query items, considered to be represented by respective training points within a region of feature space, and respective known answers to the query items to

determine partial answers for use in evaluating answers to new query items, said apparatus comprising:

a region subdividing portion operable to subdivide said region into subregions according to at least first and second subdivisions;

an iteration portion which performs at least first and second iterations, corresponding respectively to said first and second subdivisions, and operable in each said iteration to calculate a partial answer for each subregion of the corresponding subdivision in dependence upon known answers to query items represented by training points, if any, in the subregion concerned and to adjust said known answers in dependence upon those partial answers so that the adjusted known answers are usable by a subsequent iteration, if any; and

an output which outputs the calculated partial answers.

15. Data training apparatus according to claim 14, wherein said partial answer for each subregion is calculated as the average of all the known answers to query items represented by training points, if any, in the subregion concerned.

16. Data training apparatus according to claim 14, wherein said iteration portion is operable in each said iteration to calculate a partial answer for each subregion of the corresponding subdivision in dependence both upon known answers to query items represented by training points, if any, in the subregion concerned and upon known answers to query

items represented by training points, if any, in one or more subregions surrounding the subregion concerned.

17. Data training apparatus according to claim 14, wherein said iteration portion is operable in each said iteration to calculate a count value for each subregion of the corresponding subdivision in dependence upon the number of known answers to query items represented by training points, if any, in the subregion concerned, the apparatus further comprising an additional output which outputs the calculated count values.

18. Data training apparatus according to claim 14, wherein said known answers are adjusted by subtracting from them the corresponding respective partial answers.

19. Data training apparatus according to claim 14, further comprising a storage portion which is operable to store said calculated partial answers.

20. Data training apparatus according to claim 19, wherein said storage portion allocates a storage location within the storage portion to hold a partial value for a subregion only if that subregion has at least one query item represented by a training point in the subregion.

21. Data training apparatus according to claim 20, wherein said storage portion is of a sparse grid type.

22. Data updating apparatus for analysing training query items and respective known answers to the training query items, said training query items being considered to be represented by respective training points within a region of feature space and said region being subdivided into subregions according to at least first and second subdivisions, to update precalculated partial answers usable to evaluate answers to new query items, said apparatus comprising:

an input which receives such a training query item;

a subregion identifying portion operable, for each said subdivision of said region, to identify which said subregion of the subdivision contains the point representing the received training query item;

a partial answer retrieval portion having access when the apparatus is in use to a store of said precalculated partial answers for at least some said subregions of said subdivisions, and operable to retrieve from the store the partial answers for the or each identified subregion that is present in the store;

an iteration portion which performs at least first and second iterations, corresponding respectively to said first and second subdivisions, and operable in each such iteration to update the partial answer stored for the identified subregion of the corresponding subdivision in dependence upon said known answer to said received training query item and said retrieved precalculated partial answer for the identified subregion, and to adjust said known answer in dependence upon that updated partial answer so that the

adjusted known answer is usable by a subsequent iteration, if any.

23. Data updating apparatus according to claim 22, wherein said iteration portion is further operable in each such iteration to update the partial answer stored for one or more subregions surrounding the identified subregion.

24. Data updating apparatus according to claim 22, further comprising a count value retrieval portion having access when the apparatus is in use to a store of precalculated count values for at least some said subregions of said subdivisions, and operable to retrieve from the store the count values for the or each identified subregion that is present in the store, and wherein said iteration portion is operable in each such iteration to update the partial answer stored for the identified subregion of the corresponding subdivision in dependence upon said known answer to said received training query item, said retrieved precalculated partial answer for the identified subregion, and said retrieved count value for the identified subregion.

25. Data updating apparatus according to claim 24, wherein the partial answer is updated by calculating a first value equal to the known answer minus the partial answer and a second value equal to the count value plus one, and adding to the partial answer the result of the first value divided by the second value.

26. Data updating apparatus according to claim 24, wherein said iteration portion is operable to update the count value stored for the identified subregion of the corresponding subdivision in dependence upon said said retrieved count value for the identified subregion.

27. Data updating apparatus according to claim 26, wherein said count value stored for the identified subregion is updated by incrementing it.

28. Data updating apparatus according to claim 22, wherein said known answer is adjusted by subtracting from it the updated partial answer.

29. A computer-implemented data processing method for evaluating answers to respective query items considered to be represented by respective points within a region of feature space, which region is subdivided into subregions according to at least first and second subdivisions, said method comprising:

receiving such a query item;

identifying, for each said subdivision of said region, which said subregion of the subdivision contains the point representing the received query item;

accessing a store of precalculated partial answers for at least some said subregions of said subdivisions to retrieve from the store the partial answers for the or each identified subregion that is present in the store;

calculating an answer to said received query item based on the retrieved partial answers; and

outputting the calculated answer.

30. A computer-implemented data training method for analysing query items, considered to be represented by respective training points within a region of feature space, and respective known answers to the query items to determine partial answers for use in evaluating answers to new query items, said method comprising:

subdividing said region into subregions according to at least first and second subdivisions;

performing at least first and second iterations, corresponding respectively to said first and second subdivisions, and in each said iteration calculating a partial answer for each subregion of the corresponding subdivision in dependence upon known answers to query items represented by training points, if any, in the subregion concerned and adjusting said known answers in dependence upon those partial answers so that the adjusted known answers are usable by a subsequent iteration, if any; and

outputting the calculated partial answers.

31. A computer-implemented data updating method for analysing training query items and respective known answers to the training query items, said training query items being considered to be represented by respective training points within a region of feature space and said region being subdivided into subregions according to at least first and second subdivisions, to

update precalculated partial answers usable to evaluate answers to new query items, said method comprising:

receiving such a training query item;

identifying, for each said subdivision of said region, which said subregion of the subdivision contains the point representing the received training query item;

accessing a store of said precalculated partial answers for at least some said subregions of said subdivisions to retrieve from the store the partial answers for the or each identified subregion that is present in the store; and

performing at least first and second iterations, corresponding respectively to said first and second subdivisions, and in each such iteration updating the partial answer stored for the identified subregion of the corresponding subdivision in dependence upon said known answer to said received training query item and said retrieved precalculated partial answer for the identified subregion, and adjusting said known answer in dependence upon that updated partial answer so that the adjusted known answer is usable by a subsequent iteration, if any.

32. A computer-readable recording medium storing a program for evaluating answers to respective query items considered to be represented by respective points within a region of feature space, which region is subdivided into subregions according to at least first and second subdivisions, said program comprising:

a receiving code portion which receives such a query item;

a subregion identifying code portion which identifies, for each said subdivision of said region, which said subregion of the subdivision contains the point representing the received query item;

a partial answer retrieval code portion which accesses a store of precalculated partial answers for at least some said subregions of said subdivisions to retrieve from the store the partial answers for the or each identified subregion that is present in the store;

an answer calculation code portion which calculates an answer to said received query item based on the retrieved partial answers; and

an output code portion which outputs the calculated answer.

33. A computer-readable recording medium storing a program for analysing query items, considered to be represented by respective training points within a region of feature space, and respective known answers to the query items to determine partial answers for use in evaluating answers to new query items, said program comprising:

a region subdividing code portion which subdivides said region into subregions according to at least first and second subdivisions;

an iteration code portion which performs at least first and second iterations, corresponding respectively to said first and second subdivisions, and in each said iteration calculating a partial answer for each subregion of the corresponding subdivision in dependence upon known answers to query items represented by training points, if any, in the

subregion concerned and adjusting said known answers in dependence upon those partial answers so that the adjusted known answers are usable by a subsequent iteration, if any; and

an output code portion which outputs the calculated partial answers.

34. A computer-readable recording medium storing a program for analysing training query items and respective known answers to the training query items, said training query items being considered to be represented by respective training points within a region of feature space and said region being subdivided into subregions according to at least first and second subdivisions, to update precalculated partial answers usable to evaluate answers to new query items, said program comprising:

an input code portion which receives such a training query item;

a subregion identifying code portion which identifies, for each said subdivision of said region, which said subregion of the subdivision contains the point representing the received training query item;

a partial answer retrieval code portion which accesses a store of said precalculated partial answers for at least some said subregions of said subdivisions to retrieve from the store the partial answers for the or each identified subregion that is present in the store; and

an iteration code portion which performs at least first and second iterations, corresponding respectively to said first and second subdivisions, and in each such

iteration updating the partial answer stored for the identified subregion of the corresponding subdivision in dependence upon said known answer to said received training query item and said retrieved precalculated partial answer for the identified subregion, and adjusting said known answer in dependence upon that updated partial answer so that the adjusted known answer is usable by a subsequent iteration, if any.

35. A computer-readable recording medium storing partial answers created by a computer-implemented data training method for analysing query items, considered to be represented by respective training points within a region of feature space, and respective known answers to the query items to determine partial answers for use in evaluating answers to new query items, said method comprising:

subdividing said region into subregions according to at least first and second subdivisions;

performing at least first and second iterations, corresponding respectively to said first and second subdivisions, and in each said iteration calculating a partial answer for each subregion of the corresponding subdivision in dependence upon known answers to query items represented by training points, if any, in the subregion concerned and adjusting said known answers in dependence upon those partial answers so that the adjusted known answers are usable by a subsequent iteration, if any; and

outputting the calculated partial answers.

36. Data processing apparatus for evaluating answers to respective query items considered to be represented by respective points within a region of feature space, which region is subdivided into subregions according to at least first and second subdivisions, said apparatus comprising:

an input for receiving such a query item;

subregion identifying means operable, for each said subdivision of said region, to identify which said subregion of the subdivision contains the point representing the received query item;

partial answer retrieval means having access when the apparatus is in use to a store of precalculated partial answers for at least some said subregions of said subdivisions, and operable to retrieve from the store the partial answers for the or each identified subregion that is present in the store;

answer calculation means for calculating an answer to said received query item based on the retrieved partial answers; and

an output for outputting the calculated answer.

37. Data training apparatus for analysing query items, considered to be represented by respective training points within a region of feature space, and respective known answers to the query items to determine partial answers for use in evaluating answers to new query items, said apparatus comprising:

region subdividing means operable to subdivide said region into subregions according to at least first and second subdivisions;

iteration means for performing at least first and second iterations, corresponding respectively to said first and second subdivisions, and operable in each said iteration to calculate a partial answer for each subregion of the corresponding subdivision in dependence upon known answers to query items represented by training points, if any, in the subregion concerned and to adjust said known answers in dependence upon those partial answers so that the adjusted known answers are usable by a subsequent iteration, if any; and

output means for outputting the calculated partial answers.

38. Data updating apparatus for analysing training query items and respective known answers to the training query items, said training query items being considered to be represented by respective training points within a region of feature space and said region being subdivided into subregions according to at least first and second subdivisions, to update precalculated partial answers usable to evaluate answers to new query items, said apparatus comprising:

an input for receiving such a training query item;

subregion identifying means operable, for each said subdivision of said region, to identify which said subregion of the subdivision contains the point representing the received training query item;

partial answer retrieval means having access when the apparatus is in use to a store of said precalculated partial answers for at least some said subregions of said subdivisions, and operable to

retrieve from the store the partial answers for the or each identified subregion that is present in the store;

iteration means for performing at least first and second iterations, corresponding respectively to said first and second subdivisions, and operable in each such iteration to update the partial answer stored for the identified subregion of the corresponding subdivision in dependence upon said known answer to said received training q uery item and said retrieved precalculated partial answer for the identified subregion, and to adjust said known answer in dependence upon that updated partial answer so that the adjusted known answer is usable by a subsequent iteration, if any.